Marked-up original Claims

Patent Claims

1. Device for converting electric energy into mechanical energy and/or vice versa with a rotor (4) and a stator (2), particularly a combined motor/generator device (1), wherein coil windings (6) having at least two winding ends (17a, 17b; 18a, 18b; 19a, 19b) are arranged on the rotor (4) and/or the stator (2) in turn having a circumferential layout direction (13) following one after the other, and the winding ends (17a, 17b; 18a, 18b; 19a, 19b) of the various coil windings (6a; 6b; 6c) are electrically connected with one another with formation of groups of connections, whereby the device includes a connection device (7, 8, 9, 10) for the connection of the winding ends (17a, 17b; 18a, 18b; 19a, 19b) of a group of connections with electrically conductive connection distributors (8, 9, 10) running in circumferential direction, which form a connection device and are guided in one piece toward the exterior of the device, by means of which the relevant groups of connections can be electrically contacted outside the device, **characterized in that** the connection distributors (8, 9, 10) of each connection group have two electrically conductive bands (8a, 8b; 9a, 9b; 10a, 10b) which in turn are guided in one piece toward the exterior of the device and there together form a plug bushing (14; 15; 16) for the electric contacting of the relevant groups of connections.

2. Device as in Claim 1, characterized in that each winding end (17a, 17b; 18a, 18b; 19a, 19b) is connected with the associated connection distributor (8, 9, 10) in the close vicinity of the relevant coil winding (6a, 6b, 6c).

3. Device as in ~~one of the Claims~~ 1 ~~or 2~~, characterized in that the connection distributors (8,

9, 10) have a cutting/clamping device (21`;121) configured of one piece for the electric connection with the associated winding ends (17a, 17b; 18a, 18b; 19a, 19b).

4. Device as in ~~one of the~~ Claim~~s~~ 1 ~~to 3~~, characterized in that the two bands (8a, 8b; 9a, 9b; 10a, 10b) run essentially in semi-circles in circumferential direction.

5. Device as in Claim~~s~~ 1 ~~to 4~~, characterized in that the two bands (110a, 110b) in the mechanical sleeve or bearing area (114) are connected by an elastic or flexible element, preferably by a corrugated retaining ring (124).

6. Device as in ~~one of the~~ Claim~~s~~ 1 ~~to 5~~, characterized in that the bands (8a, 8b; 9a, 9b; 10a, 10b) of the individual groups of connections are arranged axially one behind the other, or are of different diameters and are arranged concentrically radially one behind the other.

7. Device as in ~~one of the~~ Claim~~s~~ 1 ~~to 6~~, characterized in that the connection distributors (8, 9, 10) are arranged electrically insulated from one another in a receiving means (7) of the connection device (7, 8, 9, 10) which can be axially and/or radially securely mounted on the rotor (4) and/or the stator (2).

8. Method for producing a device as in ~~one of the~~ Claim~~s~~ 1 ~~to 7~~, with the following steps:

- embedding of the electrically conductive bands (8a, 8b; 9a, 9b; 10a, 10b)of the connection distributors (8, 9, 10) in a receiving means (7) of the connection device (7, 8, 9, 10) in such a manner that the connection distributors (8, 9, 10) not belonging to a common group of connections are electrically insulated from one another,
- tight fastening of the connection device (7, 8, 9, 10) to the rotor (4) and/or the stator (2),
- electric connection of the winding ends (17a, 17b; 18a, 18b; 19a, 19b) with the associated connection distributors (8, 9, 10), and
- forming in turn of a plug bushing (14; 15; 16) of the connection device of one

piece out of the bands (8a, 8b; 9a, 9b; 10a, 10b) guided in one piece to the exterior of the device, these bands being part of a group of connections for the electric contacting of the relevant group of connections to the exterior of the device.

9. Method as in Claim 8, characterized in that the electric connection of the winding ends (17a, 17b; 18a, 18b; 19a, 19b) with the associated connection distributors (8, 9, 10) occurs in the close vicinity of the relevant coil winding (6a, 6b, 6c) by insertion in turn in a cutting/clamping device (21) provided on the connection distributors (8, 9, 10) and preferably of one piece, or by gluing, soldering or welding.

10. Method as in Claim 8 ~~or 9~~; characterized in that the receiving means (7) are sealed together with the embedded connection distributors (8, 9, 10), preferably by dipping in an electrically insulating synthetic resin, whereby preferably following the sealing off, contact points are accessible on the connection distributors (8, 9, 10) for the electric connection with the winding ends (17a, 17b; 18a, 18b; 19a, 19b).

11. Method as in Claim 8 ~~or 9~~; characterized in that the rotor (4) or the stator (2) together with the connection device (7, 8, 9, 10) sealed onto it and connected with the winding ends (17a, 17b; 18a, 18b; 19a, 19b) is then sealed off, preferably by dipping in an electrically insulating synthetic resin.